



RESEARCH

Cariboo Forest Region

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EXTENSION
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Winter Food Habits of Mule Deer

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Mule deer at the northern limit of their distribution use Interior Douglas-fir forests as winter range. This represents 250,000 hectares, or about 15%, of Douglas-fir forests in the Cariboo Forest Region. Resolution of the need for large, old Douglas-fir by both mule deer and the forest industry must be based on sound knowledge of mule deer habitat requirements, one of which is winter forage.

Winter ranges in the Central Interior of BC are located on a variety of habitats at lower elevations with warm aspects and dominated by Douglas-fir. Habitat type and snowpack depth directly affect forage selection by mule deer. Some plant species are specific to certain ecosystems, while fluctuations in snowpack depth cause the availability and access to forage to change.

STUDY OBJECTIVES

The study's objectives were:

- to determine the winter diet of mule deer at the northern limit of their continuous distribution,

- to relate variation in diets to differences in habitat types and snow depths, and
- to evaluate the nutritional quality of the diets among winter ranges and winters of different severity.

STUDY AREAS

Mule deer faecal pellets were collected in the Cariboo Region from seven winter ranges that are typical of the Central Interior of BC. Uneven-aged Douglas-fir is the climax forest type on each range. The drier ranges include lodgepole and ponderosa pines in the overstory with pinegrass and bluebunch wheatgrass on the forest floor. On moister sites, white spruce and subalpine fir grow in both the understory and overstory.

RESULTS

The analysis of mule deer faecal pellets showed 87 plant species; however, only a few species formed individual diets. Approximately 50-75% of the diets consisted of conifers, with

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WINTER RANGE	DISTRICT	SUBZONE
Beaver Valley	Horsefly	SBSdw1
Big Lake	100 Mile	IDFdk3
Bonaparte River	100 Mile	IDFxm
Churn Creek	Williams Lake	IDFxm, BGxh3
Knife Creek	Williams Lake	IDFdk3, IDFxm
Middle Lake	Chilcotin	IDFdk4
Tree Farm Licence #5	Quesnel	SBSmh

Summary of Winter Range Study Sites

shrubs (15–50%), forbs (up to 6%) and grasses (up to 7%), which is similar to other mule deer diet studies.

Douglas-fir was the most consistent and abundant species in the mule deer diets on all winter ranges. Mule deer select the green foliage from large, older trees. Saskatoon, soopolallie and willows were included on all winter ranges. Oregon grape, subalpine fir and red-osier dogwood were commonly consumed on the moister winter ranges, such as Beaver Valley and TFL #5. Sage was abundant in Churn Creek diets; snowbrush, western hemlock and western red cedar were common in Middle Lake diets; and ponderosa pine was found in Bonaparte River diets.

In low snowpack conditions, diets from wetter subzones contained more shrubs and less Douglas-fir. Deeper snowpacks resulted in a lower shrub content with greater Douglas-fir in the diet. At Knife Creek, a dry winter range, Douglas-fir constituted 62–89% of the diet at a variety of snow depths. Diets usually peaked in Douglas-fir content and declined in quality during January and February when snow was the deepest and shrubs less available. Over all winter ranges, the two common diet quality indices (faecal nitrogen and DAPA) were positively correlated with quantity of shrubs but negatively correlated with quantity of Douglas-fir in the diets.

CONCLUSIONS

Although mule deer winter diets include a wide variety of species, the bulk consisted of only a few. The major species is Douglas-fir, particularly in deeper snow conditions.

The availability of preferred species is strongly correlated with winter range location and snowpack depth. Mule deer consume less forbs, grasses and arboreal lichens than Douglas-fir, but these plants may be valuable because mixed diets aid digestion and increase digestible energy. Small differences in species composition in the diet influence diet quality, and thus animal condition and productivity. For example, during a winter of deep snow on wetter ranges, deer mortality is generally higher due to lower quality forage and greater energy expenditure needed to move through deep snow.

MANAGEMENT IMPLICATIONS

Douglas-fir comprises the majority of the diet for mule deer during the winter, particularly when shrubs are buried by snow. Removing a large proportion of old Douglas-fir trees reduces both foliage and arboreal lichen litterfall, and results in a deeper snowpack which buries shrubs, forbs and grasses. This requires that deer travel further in search of food and expend higher levels of energy, which can lead to poor condition and mortality.

Low volume partial cutting (typically 20% volume removal) using small

group selection openings, up to 10m in diameter, can combine timber extraction with habitat maintenance. Winter range management should also consider adjacent grasslands, because they are important foraging sites in early spring.

Cattle grazing and juvenile spacing affect forage availability. Cattle may compete for the same forage species, so the timing and duration of grazing should be controlled. Juvenile spacing helps to open up stands and increase ground forage production, but may create deeper snowpacks in the short term.

REFERENCE

Winter Food Habits of Mule Deer in the Central Interior of British Columbia, by M.J. Waterhouse, H.M. Armleder and R.J. Dawson. 1993. BC MOF Res. Note #113.

CONTACTS

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